

# The Short-Run and Long-Run Determinant of Foreign Direct Investment (FDI) in Nigeria (1980 – 2014) Using ARDL (Bound Test) Approach

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**Abstract:** - The study examined the short-run and long-run determinant of foreign direct investment (FDI) in Nigeria using ARDL (bound test) approach (1980 – 2014). The variables used are foreign direct investment (FDI), gross domestic product per capita (GDPPP), broad money supply ( $M_2$ ), trade (TRAD), inflation, consumer prices (INF), official exchange rate (EXCH), general government final consumption expenditure (GOVEEXP), school enrollment, secondary (EDU) and total electricity net consumption (ELECTCON). The data were sourced from the World Development Indicators (2015) between 1980 and 2014. The study implements ARDL model to investigate the existence of a long-run relation among the series and the dynamic model of the short-run effect. Apparently, the use of ARDL is of the submission that it can be applied irrespective of the order of integration of the variables (irrespective of whether regressors are purely [1(0)], purely [1(1)] or mutually co-integrated). The results of the study showed that there exist a long-run and short-run relationship among the variable and that the result of the long run ARDL model showed that in the long run, school enrollment (EDU), total electricity net consumption (ELECTCON), broad money ( $M_2$ ) and trade (TRAD) stimulate foreign direct investment (FDI) in Nigeria while the result of the short-run dynamic model shows that in the short-run, school enrollment (EDU), total electricity net consumption (ELECTCON), exchange rate (EXCH), inflation (INF) and trade (TRAD) are significant in determine foreign direct investment (FDI) in Nigeria. The study recommended that the government should invest more in infrastructure (like electricity, education, transportation, telecommunication, etc) so as to enhance the competitiveness of the environment of investment and ultimately increase FDI inflows. Also, the monetary authority should control money supply, exchange rate, inflation rate as well as GDP in other to encourage FDI in Nigeria.

**Keywords:** FDI, gross domestic product per capita (GDPPP),  $M_2$ , trade, inflation, exchange rate, government expenditure, school enrollment and total electricity net consumption, ARDL

## I. INTRODUCTION

Foreign direct investment (FDI) is an investment made to acquire a lasting management interest (normally 10% of voting stock) in a business enterprise operating in a country other than that of the investor defined according to residency (World Bank, 1996). Such investments may take the form of

either “Greenfield” investment (also called “mortar and brick” investment) or merger and acquisition (M & A), which entails the acquisition of existing interest rather than new investment (Macaulay, 2012). In corporate governance, ownership of at least 10% of the ordinary shares or voting stock is the criterion for the existence of a direct investment relationship. Ownership of less than 10% is recorded as portfolio investment. FDI comprises not only merger and acquisition and new investment, but also reinvested earnings and loans and similar capital transfer between parent companies and their affiliates. Countries could be both host to FDI projects in their own country and a participant in investment projects in other countries. A country’s inward FDI position is made up of the hosted FDI project, while outward FDI comprises those investment projects owned abroad. One of the most salient features of today’s globalization drive is conscious encouragement of cross-border investments, especially by transnational corporations and firms (TNCs) (Macaulay, 2012).

One of the most notable features of economic globalization is the increased flows of foreign direct investment (FDI) around the world, which prompt many countries to focus on the various determinants of FDI. This happens to be the goal of most economy around the world (that is, determinants of FDI). It is now widely acknowledged that FDI is an important aspect of the recent wave of globalization. Nigeria as a country, given her natural resource base and large market size, qualifies to be a major recipient of foreign direct investment in Africa and indeed is one of the top three lending African countries that consistently received foreign direct investment in the past decade. Nigeria share of FDI flows to Africa remain a subject of concern in the region as the nation is being regarded as the “giant” of the continent. Real foreign direct investment into Nigerian has been unstable over the years.

FDI inflows to Nigeria have remained low compared to other developing countries. For instance, FDI inflows increased from ₦786.40 million in 1980 to ₦2,193.40 million in 1982, but soon dropped to ₦1,423.50 million in 1985. The value of FDI rose from ₦6,236.70 million in 1988 to ₦10,450.0 million and ₦55,999.30 million in 1990 and 1995,

respectively (CBN, 2014). However, the value of FDI fell drastically to ₦5,672.90 million in 1996 and further to ₦4,035.50 million in 1999. The inflows of FDI has continued to rise since the year 2001, moving from ₦4,937.0 million to ₦13,531.20 million in 2003 and ₦20,064.40 million in 2004. The FDI inflows stood at ₦41,734.0 million in 2006 (CBN, 2014). In terms of growth rate, FDI inflows dropped from 95.6 percent in 1971 to -31.20 percent and -17.23 percent in 1976 and 1984, respectively. Although the growth of FDI increased by 182.68 percent in 1986, the value soon fell by -24.76 percent in 1989 and further to -89.87 percent in 1996. Since the year 2000 the growth of FDI has remained positive except in 2001 when the value was -70.00 percent. The inflows of FDI has continued to rise since the year 2001, moving from about ₦4,937.0 million to ₦13,531.20 million in 2003 and ₦20,064.40 million in 2004. The FDI inflows stood at ₦41,734.0 million in 2008 (CBN, 2014).

This study is set to investigate the short and long-run determinant of foreign direct investment (FDI) in Nigeria. The rest of the paper is structured as follows. Section two focuses on literature review and section three describes the theoretical framework and methodology. This is followed by section four that relates the results and interpretation. Section five concludes and proffers recommendation.

## II. LITERATURE REVIEW

### 2.1 Theoretical Review

#### 2.1.1 Capital Market Theory

Capital market theory is one of the oldest theories of foreign direct investment. According to this theory, foreign direct investment is determined by interest rates. Capital market theory is a part of portfolio investment (Iversen, 1935; Aliber, 1971). Boddewyn's (1985) Capital market theory talked about three positions which attract Foreign Direct Investment to the less developed countries (LDCs). First is the undervalued exchange rate, which allows lower production costs in the host countries. Second position said that since there is no organized securities exists, therefore long term investments in LDCs will often be FDI rather than purchase of securities. The third position is that, since there is limited knowledge about host countries securities that is why it favours FDI which allows control of host country assets.

#### 2.1.2 Dynamic Macroeconomic Foreign Direct Investment Theory

**The dynamic macroeconomic foreign direct investment theory** analyzed that the timing of investments is depends on the changes in the macroeconomic environment (SanjayaLall 1997). The macroeconomic environment consists of gross domestic product, domestic investment, real exchange rate, productivity and openness which are the determinants of Foreign Direct Investment flows. This theory states that FDI's are a long term function of multinational companies' strategies.

#### 2.1.3 Eclectic Theory

Dunning (1980, 1988) considered the internalization theory is a very important and used it in his **eclectic theory**. But he argues that internalization theory explains only part of FDI flows. He draws partly on macroeconomic theory and trade as well as microeconomic theory and firm behaviour. The eclectic theory of John Dunning is a mix of three different theories of FDI, i.e. OLI (Denisia, 2010).

1) *Ownership Advantages*: This refer to intangible assets, which are, at least for a while exclusive possesses of the company and may be transferred within transnational companies at low costs, leading either to higher incomes or reduced costs. But transnational companies (TNCs) operations performed in different countries face some additional costs. Thereby to successfully enter a foreign market, a company must have certain characteristics that would triumph over operating costs on a foreign market. These advantages are the property competences or the specific benefits of the company. The firm has a monopoly over its own specific advantages and using them abroad leads to higher marginal profitability or lower marginal cost than other competitors. (Dunning, 1973, 1980, 1988). There are three types of specific advantages:

- a) Monopoly advantages in the form of privileged access to markets through ownership of natural limited resources, patents right, trademarks;
- b) Technology, knowledge broadly defined so as to contain all forms of innovation activities
- c) Economies of large size such as economies of learning, economies of scale and scope, greater access to financial capital;

2) *Location Advantages*: When the first condition is fulfilled, it must be more advantageous for the company that owns them to use them itself rather than sell them or rent them to foreign firms. Location advantages of different countries are the key factors to determining who will become host countries for the activities of the transnational corporations. The specific advantages of each country can be divided into three categories:

- a) The economic benefits consist of quantitative and qualitative factors of production, costs of transport, telecommunications, market size etc.
- b) Political advantages: common and specific government policies that affect FDI flows
- c) Social advantages: includes distance between the home and home countries, cultural diversity, attitude towards strangers etc.

3) *Internalization Advantages*: Supposing the first two conditions are met, it must be profitable for the company the use of these advantages, in collaboration with at least some factors outside the country of origin (Dunning, 1973, 1980, 1988).

This third characteristic of the eclectic paradigm OLI offers a framework for assessing different ways in which the

company will exploit its powers from the sale of goods and services to various agreements that might be signed between the companies. As cross-border market Internalization benefits is higher the more the firm will want to engage in foreign production rather than offering this right under license, franchise. Eclectic paradigm OLI shows that OLI parameters are different from company to company and lied on context and reflect the economic, political, social characteristics of the host country. Therefore the objectives and strategies of the firms, the magnitude and pattern of production will depend on the challenges and opportunities offered by different types of countries.

From OLI theory four types of FDI derived, they are resource seeking FDI; market seeking FDI; efficiency seeking FDI and strategic asset/capabilities seeking FDI.

## 2.2.2 Empirical Review

### 2.2.2.1 Review of Empirical Studies on Determinants of Foreign Direct Investment (FDI) and Economic Growth in Nigeria

Some study that focuses on Nigeria has diverse arguments on this topic. For instance, Oladipo, (2013) examined the macroeconomic determinants of foreign direct investment in Nigeria using secondary data. Annual time series data for the period of 1985 to 2010 on macroeconomic variables such as Foreign Direct Investment (FDI), Money Supply (MS), Gross Domestic Product (GDP), Inflation (INF), Trade Openness (OP), Government Capital Expenditure (GCE), Government Recurrent Expenditure (GRE), Poverty Level (POV), Exchange Rate (EXR) and Interest Rate (INR) are sourced from the 2010 Central Bank of Nigeria Statistical Bulletin published by the Central Bank of Nigeria. Generalised Method of Moment (GMM) is adopted for the analysis of the macroeconomic determinant of foreign direct investment. The results from the GMM estimates show that only EXR, INR, MS and OP determine foreign direct investment in Nigeria, and that they both determine foreign direct investment positively given that ( $p > 0.05$ ) i.e. at 5% level of significance, except that of GRE and previous FDI which determine FDI negatively at 10% level of significance. However, the effect of money supply on foreign direct investment in Nigeria is stronger than that of other variables given the coefficient of money supply which is 2.82 per cent.

Oba and Onuoha, (2013) investigated some factors that influence the foreign direct investment in Nigeria, and their impact on the economy. The data used in this study covered a period of ten years (2001 -2010) and considered such variables such as real GDP, inflationary levels, openness of trade, electricity consumption, transport and communication. Econometric model and regression analysis were employed to analyse the data. The results based on the value of F-statistics (35.83) and the co-efficient of determination (R<sup>2</sup>) of 0.98 revealed that the model was well specified and that the explanatory variables are sufficient to explain the inflow of FDI to Nigeria. The negative values of

parameters such as the real GDP, inflation and electricity consumption call for policy reconsiderations.

Ebiringa and Emeh, (2013) examined determinants of foreign direct investment (FDI) inflows using Nigeria as a case study, with specific attention on exchange rate, gross domestic product (GDP), inflation, stock market capitalization and interest rate. The study was motivated by the need to promote policies that attracts foreign capital for sustainable economic growth. Unit root test, Co-integration test, Variance decomposition and Error Correction Model (ECM) constituted the analytical methods. Results obtained shows that all the selected determinants individually and jointly exerted significant long run effects on FDI inflows. The recommendation therefore is that concerted efforts must be made to strengthen the capacity of economic planning and management institutions in order to ensure stability in macroeconomic performance, which boosts the confidence of foreign investors in the Nigeria.

Ojong, Arikpo and Ogar, (2015) examined the factors that determine FDI inflow in Nigeria. Time series data were collected from the CBN statistical Bulletin using the desk survey method and were analyzed using the ordinary least square multiple regression statistical technique. ADF and PP unit root were complementarily applied to test the stationarity of the time series. A correlation matrix was also used to check the relationship between all the variables. Result on the basis of the OLS revealed that there is a large inverse effect of market capitalization and gross fixed capital formation on FDI inflow in Nigeria. Also an over liberal trade policy is a disincentive for foreign direct investment in Nigeria. Finally, there exists a significant positive effect of level of economic growth on FDI attraction in Nigeria. On the basis of the ADF and PP test, all variable were stationary at first difference. Again, on the basis of the correlation matrix, all variables were strongly related except market capitalization, gross fixed capital formation and level of economic activities which had weak relation with FDI.

### 2.2.2.2 Review of Empirical Studies on Foreign Direct Investment determinants and Economic Growth in other part of the World

Various studies have been carried out on this topic “determinants of foreign direct investment” using developed countries as their case studies. In fact, the studies have point to various factors as the main determinant of FDI in their respective countries. For instance, UNCTAD, (1999) submitted that FDI has either a positive or negative impact on output depending on the variables that are entered alongside it in the test equation. These variables include the initial per capita, gross domestic product (GDP), education attainment, domestic investment ratio, political instability, terms of trade, black market exchange rate premiums, and the state of financial development. Examined other variables that could explain the interaction between FDI and growth.

Walsh and Yu, (2010) made use of a dataset which breaks down FDI flows into primary, secondary and tertiary sector investments and a Generalized Method of Moment (GMM) dynamic approach to address concerns about endogeneity, the paper analyzed various macroeconomic, developmental, and institutional/qualitative determinants of FDI in a sample of emerging market and developed economies. While FDI flows into the primary sector show little dependence on any of these variables, secondary and tertiary sector investments are affected in different ways by countries' income levels and exchange rate valuation, as well as development indicators such as financial depth and school enrollment, and institutional factors such as judicial independence and labor market flexibility. They finally find that the effect of these factors often differs between advanced and emerging economies. The non-develop world and the developing world also focus on this same topic using their countries and regions and came up with various outcome.

Shahzad, Mithani, Al-Swidi and Fadzil, (2012) investigated the major determinants which influence FDI inflows in Pakistan. More importantly, the inflows of FDI in Pakistan have declined since 2008. The study sought to analyze the role of Political instability in the country economic growth, thus, to explain that although Pakistan has many attractive natural resources for investment, the political instability situation has been one of the main causes affecting the FDI inflows in Pakistan. The study aimed at developing a research framework that can be studied empirically by other researchers.

Carike, Elsabé and Henri, (2012) examined Chinese FDI flows to Africa between 2003 and 2008. During this period, China's outward FDI to Africa was concentrated in diversified, medium growth economic performers, with Southern Africa being the most popular region for Chinese outward FDI. A literature survey on Chinese investment deals concluded in Africa, demonstrated a definite Chinese interest in mining, oil and infrastructure in Africa. Using panel data analysis, agricultural land, market size and oil are found to be important determinants of Chinese FDI. The fact that market size was important indicated that Chinese investment was not solely resource-driven. As regards the possibility that Chinese FDI could positively contribute to economic growth in Africa, causality tests concluded that the relationship between African GDP and Chinese FDI was bi-directional, while uni-directional relationships were established between Chinese FDI and African infrastructure and corruption, respectively.

Nwosu, Orji, Urama and Amuka, (2013) investigated the role of regional integration in attracting foreign direct investment. The paper divided foreign direct investment into Inter-and Intra-ASEAN to see if both are determined by the same set of factors. If economic integration drives intra-ASEAN FDI the study would expect such FDI to be unrelated to macroeconomic fundamentals in each country, while the study would expect Extra-ASEAN FDI to be determined by macroeconomic fundamentals. The study employed panel data

model in the analyses and the findings show that FDI from rest of the world are determined by macroeconomic fundamentals especially market size (GDP) and exchange rate, while inter-ASEAN FDI was not significantly related to macroeconomic fundamentals but depends on previous investments in the region. This implied most investments in ASEAN from ASEAN are motivated by economic integration.

Melek, (2013) investigated factors that determine foreign direct investment inflows in the framework of fiscal, economic, political and institutional dimensions. In terms of empirical search, the factors that effect FDI are investigated for the 11 OECD countries between 1995-2008 period, by using Dynamic Panel Data Model and GMM Estimation Technique of Arellano-Bover (1995) and Blundell and Bond (1998). It has been observed that political and institutional factors also have great importance to be considered beside economic and fiscal factors.

Akpanung, (2013) in his paper surveyed some theoretical and empirical literature on the motives and determinants of foreign direct investments in most countries. Strategic, behavioural, and economic considerations appear to be the basic motivations for FDI; while, the main determinants of FDI consist of market size variables, labor market conditions, institutional variables, macroeconomic policy variables and the global supply of FDI. The size of the host market and its growth rate are measured by GDP, the growth rate of real GDP per capita or real GDP growth. Labor market conditions include the wage rates and the quality of labor, while institutional variables include the level of corruption; tariff barriers, openness to foreign trade and the quality of infrastructure constitute policy-related variables. The paper was no doubt a contribution to the existing literature on Foreign Capital Inflows, and would therefore guide policy reforms on FDI inflows in most developing and emerging countries.

Kariuki, (2015) examined the factors that influence foreign direct investment (FDI) flows into African countries. FDI flows are important for African nations as they promote economic development. Estimation results using the Least Squares Dummy Variable model also known as the fixed effects model indicate that (i) a high economic risk has a negative and significant effect on FDI flows into Africa (ii) both political risk and financial risk have a negative but insignificant impact on FDI inflows (iii) there is a positive and significant relationship between the commodity price index performance and FDI inflows (iv) the good performance of stock markets in developed countries has a positive and significant impact on FDI inflows (v) an increase in the infrastructure of a country has a positive and significant effect on FDI inflows (vi) an increase in openness to trade has a positive and significant effect on FDI inflows (vii) the amount of FDI received in the previous year by African countries is significant in influencing the FDI flows that come into the African continent in the current year. Annual data from 1984

until 2010 using 35 African countries is used for this panel study.

### III. THEORETICAL FRAMEWORK AND METHODOLOGY

#### 3.1 Theoretical Framework

The theoretical framework of this study is based on capital market theory and dynamic macroeconomic theory of foreign direct investment (FDI). According to the capital market theory, foreign direct investment (FDI) is determined by interest rates and exchange rates (Boddewyns, 1985) while the dynamic macroeconomic foreign direct investment theory posited that foreign direct investment (FDI) is determined by the changes in the macroeconomic environment (SanjayaLall 1997). The macroeconomic environment consists of gross domestic product, domestic investment, real exchange rate, productivity and trade openness which are the determinants of foreign direct investment flows. Going by this, the framework for analyzing the model is thus presented below

#### Capital Market Theory

$$FDI=f(INT \& EXCH) \quad (3.1)$$

Foreign Direct Investment is a function of interest rate and exchange rate.

#### Dynamic macroeconomic theory

$$FDI= f(GDP, INV, EXCH\&TRAD) \quad (3.2)$$

Foreign direct investment is a function of gross domestic product (GDP), investment, real exchange rate and trade openness.

In order to merge the argument of capital market theory with Dynamic macroeconomic theory of Foreign Direct Investment (FDI) equation (3.1) will be brought together with equation (3.2).

Thus:

$$FDI= f(INT, GDP, INV, EXCH\& TRAD) \quad (3.3)$$

Other variables such as level of education, inflation rate, electricity utilization and government consumption and broad money supply.

Therefore:

$$FDI = f(L(GDPPC), M_2, GOVEXP, TRAD, INF, EXCH, EDU\&L(ELECTCON)) \quad (3.4)$$

#### 3.2 Research Methodology

##### 3.2.1 Model Specification

The model for estimation is specified based on the theoretical framework discussed above and the linear regression model is thus presented below:

$$FDI = a_0 + a_1L(GDPPC) + a_2M_2 + a_3TRAD + a_4INF + a_5EXCH + a_6GOVEXP + a_7EDU + a_8L(ELECTCON) + u \quad (3.5)$$

Where: FDI = Foreign direct investment, net inflows (% of GDP)

GDPPC = GDP per capita (constant 2005 US\$)

$M_2$  = Broad money (% of GDP)

TRAD = Trade (% of GDP)

INF = Inflation, consumer prices (annual %)

EXCH = Official exchange rate (LCU per US\$, period average)

GOVEEXP = General government final consumption expenditure (% of GDP)

EDU = School enrollment, secondary (% gross)

ELECTCON = Total Electricity Net Consumption (Billion Kilowatthours).

##### 3.2.2 Data Requirement and Sources

The required data for this project were sourced from the World Development Indicators (online 2015). The time ranges from 1980 – 2014. However, all the variables are in natural logarithm, this is done in order to reduce heteroscedasticity.

##### 3.2.3 Estimation Technique

The study will make use of the Auto-regressive Distributed Lagged model (ARDL) and Error Correction Model (ECM) in establishing the determinants of Foreign Direct Investment and economic growth in Nigeria. The Auto – Regressive Distributed Lagged model and Error Correction Model are used because of the nature of the variables when the unit root test was carried out for both Augmented Dickey–Fuller (ADF) and Phillips- Perron (PP), it was discovered that stationarity varies between level [1(0)] and First difference [1(1)] among the variables.

## IV. THE RESULTS AND INTERPRETATION

### 4.1 Preliminary Analysis

#### 4.1.1 Unit Root Test

The study test for unit roots on foreign direct investment (FDI), gross domestic product per capita (GDPPP), broad money supply ( $M_2$ ), trade (TRAD), inflation, consumer prices (INF), official exchange rate (EXCH), general government final consumption expenditure (GOVEEXP), school enrollment, secondary (EDU) and total electricity net consumption (ELECTCON). In other to test for unit root of the variables, Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit Root Test will be employ. The study makes use of unit root in order of guarantee that our inference regarding the important issue of stationarity is unlikely driven by the choice of testing procedures used.

Table 4.1 Unit Root Test using both Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP)

Variable		Unit Root Tests		Order of Co-integration
		ADF	PP	
EDU	Level	-3.8698*	-3.8698*	I(0)
	1 <sup>st</sup> Difference	-4.4121*	-4.9369*	
L(ELECTCON)	Level	-1.1162	-1.0215	I(1)
	1 <sup>st</sup> Difference	-7.7414*	-7.8243*	
L(GDPPC)	Level	0.0777	-0.3477	I(1)
	1 <sup>st</sup> Difference	-4.7427*	-4.7396*	
INF	Level	-3.2022	-3.1081	I(1)
	1 <sup>st</sup> Difference	-5.9920*	-12.875*	
TRAD	Level	-1.9149	-1.9318	I(1)
	1 <sup>st</sup> Difference	-7.4239*	-7.3803*	
EXCH	Level	-1.8698	-1.8446	I(1)
	1 <sup>st</sup> Difference	-4.9173*	-4.9173*	
M2	Level	-3.2519	-2.1417	1(1)
	1 <sup>st</sup> Difference	-4.8766*	-7.1782*	
FDI	Level	-2.0676	-2.9166	1(1)
	1 <sup>st</sup> Difference	-9.8964*	-10.753*	
GOVEXP	Level	-2.5639	-2.5826	1(1)
	1 <sup>st</sup> Difference	-6.4195*	-6.4576*	

Note: \* and \*\* denote 1%, and 5% level of significance respectively. Source: Author's Estimation from E-view 7.

The above results in Table 4.1 show that the variables are non-stationary at levels except school enrollment, secondary (EDU). The unit root tests applied to the variables at levels reject the null hypothesis of stationarity of some of the variables used except school enrollment, secondary (EDU). The variables are therefore differenced once in order to perform stationarity tests on difference variables. After differencing the variables once, the remaining variables were confirmed to be stationary. The ADF and PP test applied to the first difference of the data series accept the null hypothesis of stationarity for all the variables used. It is, therefore, worth concluding that the most of the variables are integrated of order one. It was discovered that stationarity varies between level [I(0)] and first difference [I(1)] among the variables and as a result, the study will make use of the Auto-regressive Distributed Lagged model (ARDL) and Error Correction Model (ECM).

4.1.2 Test Statistics and Choice Criteria for Selecting the Order of the VAR Model

The lower the value of Akaike info criterion (AIC) and Schwarz criterion (SIC), the better the model. Among the number of lag, lag two has lowest AIC and SIC and therefore, lag two is a better model.

Table 4.2: Test Statistics and Choice Criteria for selecting the order of The VAR model

Lag order	Akaike info criterion (AIC)	Schwarz criterion (SIC)	HQ	Log-Likelihood
Lag 2	3.380133	4.616847	3.790069	-27.08212

Note: The optimal lag structure is determined by Schwarz Info Criterion. Source: Author's Estimation from E-view 7.

4.1.3 Breusch-Godfrey Serial Correlation LM Test

This is used to test the serial correlation of the model. The probability value of 0.1986 means that we cannot reject null hypothesis rather we accept null hypothesis. It means that the model has no serial correlation. Since the model has no serial correlation, the study will also conduct CUSUM test to know whether the model is stable.

Table 4.3: Breusch-Godfrey Serial Correlation LM Test

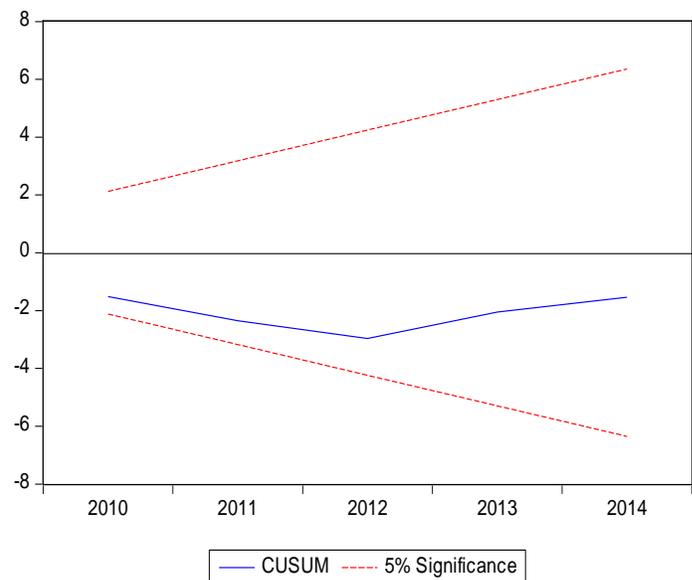
F-statistic	0.168576	Prob. F(2,3)	0.8523
Obs*R-squared	3.232964	Prob. Chi-Square(2)	0.1986

Source: Author's Estimation from E-view 7.

4.1.4 CUSUM Test

Since the link of CUSUM test is within the two red links, the model is stable. Therefore, the model does not have any serial correlation and the model is stable. The study will go for bound test and also test for long-run relationship among the variable.

Figure 4.1: CUSUM Test



Source: Author's Estimation from E-view 7.

4.1.5 Bound Testing for Co-Integration

The F-statistics is 4.029060 and this will be compared with Pesaran Critical value at 5 percent level. Therefore, the model is unrestricted intercept and no trend. From the Pesaran table, lower bound value is 2.037 and upper bound value is 3.153. The guideline is that when F-statistics is more than upper bound value, we reject the null hypothesis. As the value of our F-statistic exceeds the upper bound at the 5% significance level, we can conclude that there is evidence of a long-run relationship between the time-series (at this level of significance or greater).  $4.029060 > 3.153$ , therefore will reject null hypothesis and there is a long-run association among the key variables.

Table 4.4: Bound Testing for Co-Integration

Pesaran et al (2001)			Wald Test
Critical Value	Lower Bound Value	Upper Bound Value	Lag Order 2
5 %	2.037	3.153	4.029060 (0.2261)

Source: Author's Estimation from E-view 7.

4.2 Post Diagnostic Test

4.2.1 Estimated Long-Run Coefficients Using the ARDL Approach

The study measures the long-run dynamics of the relationship FDI and it determinant. The model used the ARDL approach of co-integration regression, following the fact that all the variables are not integrated of the same order; the Long-run parameters of the Auto-Regressive Distributed Lag (ARDL) are estimated based on the Akaike Information Criterion (AIC). From the result of the long run ARDL, school

enrollment (EDU), total electricity net consumption (ELECTCON), broad money (M<sub>2</sub>) and trade (TRAD) are statistically significant in determine foreign direct investment (FDI) in the long- run and total electricity net consumption (ELECTCON) is negatively related to foreign direct investment (FDI) in Nigeria. That is, in the long run, if total electricity net consumption (ELECTCON) increases by 1 percent, there will be a 0.47139% decrease in foreign direct investment (FDI) in Nigeria while school enrollment (EDU), broad money (M<sub>2</sub>) and trade (TRAD) increases by 1 percent, there will be a respective 0.22861%, 0.18980 and 0.15299% increase in foreign direct investment (FDI) in Nigeria.

Also, exchange rate (EXCH), GDP per capita (GDPPC), general government final consumption expenditure (GOVEEXP) and inflation rate (INF) are statistically significant in determine foreign direct investment (FDI) in the long- run and general government final consumption expenditure (GOVEEXP) is negatively related to foreign direct investment (FDI) in Nigeria. That is, in the long run, if general government final consumption expenditure (GOVEEXP) increases by 1 percent, there will be a 0.079518% decrease in foreign direct investment (FDI) in Nigeria while exchange rate (EXCH), GDP per capita (GDPPC) and inflation rate (INF) are found to be positively related to foreign direct investment (FDI) in Nigeria meaning that a 1 percent increase in exchange rate (EXCH), GDP per capita (GDPPC) and inflation rate (INF) will bring about a respective 0.0052764%, 0.0011781% and 0.0087650% increase in foreign direct investment (FDI). From the foregoing analysis, the result of the long run ARDL model shows that in the long run, school enrollment (EDU), total electricity net consumption (ELECTCON), broad money (M<sub>2</sub>) and trade (TRAD) stimulate foreign direct investment (FDI) in Nigeria.

Table 4.5: Estimated Long-Run Coefficients Using the ARDL Approach

Estimated Long Run Coefficients using the ARDL Approach  
 ARDL(1,2,2,2,2,1,2,2,2) selected based on Akaike Information Criterion  
 \*\*\*\*\*  
 Dependent variable is FDI  
 \*\*\*\*\*

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
EDU	.22861	.081480	2.8058 [.023]**
ELECTCON	-.47139	.25023	-1.8838 [.096]*
EXCH	.0052764	.010015	.52683 [.613]
GDPPC	.0011781	.0041931	.28097 [.786]
GOVEEXP	-.079518	.068794	-1.1559 [.281]
INF	.0087650	.026861	.32631 [.753]
M2	.18980	.048749	3.8934 [.005]*
TRAD	.15299	.028805	5.3114 [.001]*
C	-10.0469	2.6671	-3.7670 [.005]*

\*\*\*\*\*

Source: Author's Estimation from Microfit 4.1

Note: \*, \*\* and \*\*\* denote 1%, 5% and 10% level of significance respectively

4.2.2 Result of the Short Run Error Correction Model Using the ARDL Approach

The error correction model (ECM) is a short run dynamic model; it depicts the speed of convergence to equilibrium

once the equation is shocked. Since the long-run co-integrating model has been estimated, the next step is to model the short-run dynamic parameters within the ARDL framework. Thus, the lagged valued of all level variables (a

linear combination is denoted by the error-correction term, ECM(-1) is retained in the ARDL model. The parsimonious result of the error correction model is presents using the ARDL approach. The result shows an ECM value of -1.2480 which is otherwise referred to as the speed of adjustment. The speed of adjustment is significant at 1 percent level considering its probability value. Also, the ECM is correctly signed and statistically significant with the speed of convergence to equilibrium at 124.8 percent. That is 124.8percent of the short-run inconsistencies are being corrected and incorporated into the long-run relationship. The implication is that the present value of foreign direct investment (FDI) will adjust to changes in the school enrollment (EDU), total electricity net consumption (ELECTCON), exchange rate (EXCH), GDP per capita (GDPPC), general government final consumption expenditure

(GOVEEXP), inflation rate (INF), broad money (M<sub>2</sub>) and trade (TRAD).

Also, the result shows that school enrollment (EDU), total electricity net consumption (ELECTCON), exchange rate (EXCH), broad money (M<sub>2</sub>) and trade (TRAD) have negative relationships with foreign direct investment (FDI) in Nigeria in the short-run but school enrollment (EDU), total electricity net consumption (ELECTCON), exchange rate (EXCH) and trade (TRAD) are significant. Moreover, GDP per capita (GDPPC) and inflation (INF) have positive relationship with foreign direct investment (FDI) in Nigeria. Inflation (INF) is significant at 5 percent level. From the above analysis, it is evident that the result of the short-run dynamic model shows that in the short-run, school enrollment (EDU), total electricity net consumption (ELECTCON), exchange rate (EXCH), inflation (INF) and trade (TRAD) are significant.

Table 4.6: Result of the Short Run Error Correction Model Using the ARDL Approach

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Error Correction Representation for the Selected ARDL Model
ARDL(1,2,2,2,2,1,2,2,2) selected based on Akaike Information Criterion
*****
Dependent variable is dFDI
*****
Regressor      Coefficient      Standard Error      T-Ratio[Prob]
dEDU           -.14159          .14536              -.97403[.345]
dEDU1          -.71735          .16390              -4.3766[.000]*
dELECTCON      -.62562          .21434              -2.9188[.010]**
dELECTCON1     -.36505          .16241              -2.2477[.039]
dEXCH          -.048071         .023891             -2.0121[.061]
dEXCH1         -.12186          .027672             -4.4038[.000]*
dGDPPC         -.0026243        .0053210            -.49320[.629]
dGDPPC1        .0067317         .0048599            1.3852[.185]
dGOVEEXP       .34594           .089338             3.8723[.001]*
dINF           -.017019         .016045             -1.0607[.305]
dINF1          .050310          .023048             2.1829[.044]**
dM2            -.085364         .051249             -1.6657[.115]
dM21           -.077260         .062368             -1.2388[.233]
dTRAD          .026510          .016498             1.6069[.128]
dTRAD1         -.14928          .028837             -5.1768[.000]*
dC             -12.5389         3.5918              -3.4910[.003]*
ecm(-1)        -1.2480          .13860              -9.0047[.000]*
*****
R-Squared      .98057           R-Bar-Squared      .92229
S.E. of Regression .67781         F-stat.             F( 16, 16) 25.2368[.000]
Mean of Dependent Variable .057815       S.D. of Dependent Variable 2.4315
Residual Sum of Squares 3.6754         Equation Log-likelihood -10.6100
Akaike Info. Criterion -35.6100       Schwarz Bayesian Criterion -54.3164
DW-statistic   2.0399
*****

```

Source: Author's Estimation from Microfit 4.1

Note:\*, \*\* and \*\*\* denote 1%, 5% and 10% level of significance respectively

### V. CONCLUSIONS AND POLICY RECOMMENDATIONS

The study examined the short-run and long-run determinant of foreign direct investment (FDI) in Nigeria using ARDL (bound test) approach (1980 – 2014). The study implements ARDL model to investigate the existence of a long-run relation among the series and the dynamic model of the short-run effect. Apparently, the use of ARDL is of the submission that it can be applied irrespective of the order of integration of the variables (irrespective of whether regressors are purely

[1(0)], purely [1(1)] or mutually co-integrated). The results of the study show that there exist a long-run and short-run relationship among the variable and that the result of the long run ARDL model shows that in the long run, school enrollment (EDU), total electricity net consumption (ELECTCON), broad money (M<sub>2</sub>) and trade (TRAD) stimulate foreign direct investment (FDI) in Nigeria while the result of the short-run dynamic model shows that in the short-run, school enrollment (EDU), total electricity net

consumption (ELECTCON), exchange rate (EXCH), inflation (INF) and trade (TRAD) are significant in determining foreign direct investment (FDI) in Nigeria.

The following recommendations are given:

- (1) The government should invest more in infrastructure (like electricity, education, transportation, telecommunication, etc.) so as to enhance the competitiveness of the environment of investment and ultimately increase FDI inflows.
- (2) Also, the monetary authority should control the money supply, exchange rate, inflation rate as well as GDP in order to encourage FDI in Nigeria.

#### REFERENCES

- [1]. Akpansung R., (2013) "Market-Oriented Institutions and Policies and Economic Growth: A Critical Survey" *Journal of Economic Surveys* Vol. 20, No. 2, pp. 157-191
- [2]. Arellano-Bover (1995)
- [3]. Boddewyns T., (1985) "Stock Market Prices Do Not Follow Random Walks: Evidence From a Simple Specification Test" *The Review of Financial Studies*, Vol. 1, pp. 41-66
- [4]. Carike H. A., Elsabé I. and Henri B. N., (2012) "Economic Freedom and Performance in ECOWAS Countries: A Dynamic Panel Data Approach" *Africa Journal of Economic Policy*, Vol. 18, No. 2, pp. 28-53
- [5]. Ebiringa, O. T and Emeh E., (2013) "Determinants of Foreign Direct Investment Inflow: A Focus on Nigeria" *European Journal of Business and Management* Vol.5, No.24, pp. 41 – 53
- [6]. Kariuki C., (2015) "The Determinants of Foreign Direct Investment in the African Union" *Journal of Economics, Business and Management*, Vol. 3, No. 3, pp. 346 – 351
- [7]. Macaulay E. D., (2012) "Foreign Direct Investment And The Performance of the Nigerian Economy" *Proceedings of the 1st International Technology, Education and Environment Conference*, Vol. 6, No 4, pp. 1 – 5
- [8]. Melek A. G., (2013) "Determinants of Foreign Direct Investment for OECD Countries: Evidence from Dynamic Panel Data Analysis" *British Journal of Economics, Finance and Management Sciences* Vol. 7, No. 2, pp. 119 – 140
- [9]. Nwosu, Orji, Urama and Amuka, (2013)
- [10]. Oba U. O. and Onuoha C., (2013) "The Determinants of Foreign Direct Investments (FDIs) and the Nigerian Economy" *American International Journal of Contemporary Research* Vol. 3 No. 11, pp. 32 – 45
- [11]. Ojong S, Arikpo H and Ogar A., (2015) "Determinants of foreign direct investment in Africa" *J. Dev. Soc.* Vol. 20, pp. 89-106
- [12]. SanjayaLall K., (1997) "Direct Private Foreign Investment and Economic Growth in Nigeria (1980-1996): An Empirical Investigation" *Unpublished Ph.D. Thesis. Zaria: Ahmadu Bello University*
- [13]. Shahzad A., Mithani D. A., Al-Swidi A. K. and Fadzil F. H., (2012) "Political Stability and the Foreign Direct Investment Inflows in Pakistan" *British Journal of Arts and Social Sciences* Vol.9 No. 2, pp. 199 – 213
- [14]. UNCTAD, (1999) Foreign Private Investments in African performance and potentials
- [15]. Walsh T. O. and Jiangyan G. H., (2010), "Foreign Direct Investment Theories: An Overview of the Main FDI Theories" *European Journal of Interdisciplinary Studies*" No.10, pp. 53-59
- [16]. World Bank, (1996) World Debt Tables: External Finance for Developing Countries. Vol. 1 (Analysis and Summary Tables). Washington, D. C